

REMARKS

In response to an Office Action mailed on April 24, 2006, Applicant respectfully requests reconsideration of the pending claims. With entry of the above-listed Amendments, claims 1, 7 and 13 are amended. Claims 2-6, 8-12 and 14-21 are original. No claims are canceled. Claims 22-24 are new. Thus, twenty-four claims are presented for examination; of these, claims 1, 7 and 13 are independent, and the remaining claims are dependent.

The Examiner rejected claim 1-21 under 35 U.S.C. 103(a) as being obvious over U.S. Pat. No. 6,709,111 to Hirao, *et al.* ("Hirao") in view of U.S. Pat. No. 6,388,392 to Flory, IV ("Flory") and further in view of U.S. Pat. No. 4,618,803 to Hardy ("Hardy"). The Applicant respectfully traverses this rejection.

The Application discloses and claims a fan controller that includes an input for receiving an input voltage. The input voltage energizes rotor circuitry that controls rotation of a rotor having a fan blade. The fan controller also includes a capacitive store that is charged by the input voltage. A current limiting element is coupled in series between the input and the capacitive store to control an amount of current flow from the input to the capacitive store. The capacitive store is in electrical communication with the rotor circuitry. Thus, if the input voltage becomes insufficient to operate the rotor circuitry, the capacitive store provides voltage to operate the rotor circuitry. Such a fan controller can be used, for example, in a light projection system to cool a projection bulb in case of a power failure or after the projection system is turned off, but before the bulb has cooled.

Claim 1 has been amended to recite, "a current limiting element coupled in series between the input and the capacitive storage, the current limiting element at least in part controlling an amount of current flow from the input to the capacitive storage." (Emphasis added.) The other independent claims have been similarly amended.

Cited Art

Hirao discloses a fan controller that operates a fan motor at a slowest possible speed, thus minimizing the amount of noise created by the fan. The fan motor requires a first minimum voltage to start turning. However, once turning, the fan motor will continue to turn, even if it is supplied with a lower voltage, down to a second minimum voltage. The fan controller starts the fan motor by supplying the first minimum voltage. The controller then reduces the voltage to the

second minimum voltage. After the motor is thus started, the controller supplies a voltage in proportion to a sensed temperature, so the fan motor speeds up as the temperature increases, up to a predetermined maximum voltage. (Col. 2, lines 13-32.) Later, when a power off command is received, current to the fan is shut off. (Col. 5, lines 25-27.) As noted by the Examiner, Hiaro does not disclose capacitive storage nor a current limiting element, as recited in claim 1.

Flory discloses an energy storage bank (ESB) 48 or 68 that includes one or more capacitors connected to each other in parallel or in series. The ESB 48 or 68 is used on heavy equipment, such as an electromagnetic crane in a steel mill. The ESB 48 or 68 is connected in parallel with a lamp on the crane and to a voltage supply. If the supply voltage drops off totally or below a level necessary to operate the lamp, the ESB 48 or 68 supplies power to the lamp, until the capacitor(s) in the ESB 48 or 68 discharge. A blocking rectifier 62 (Figs. 7 and 8) between the ESB 48 or 68 and the supply 64 prevents the ESB 48 or 68 from supplying non-lighting loads. (Col. 2, lines 24-61.) That is, the blocking rectifier 62 prevents any current from flowing from the ESB 48 or 68 to the input (more specifically, to a non-lighting load on the other side of the input). The blocking rectifier 62 does not, however, control an amount of current flow, nor does the blocking rectifier 62 control current flow from the input 64 to the ESB 48 or 68, as recited in claim 1.

Hardy discloses a current-limited strobe charging circuit. The circuit includes a storage capacitor 28. After a long period of disuse, if the capacitor 28 were to be connected to a voltage source without a current limiter, a dangerously high leakage current would flow through the capacitor 28, and the capacitor 28 may overheat, rupture or explode. Allowing a limited current to flow through the capacitor 28 “reforms” the capacitor. Once the capacitor 28 is reformed, no further current limitation is required. A positive temperature coefficient (PTC) resistor 18 is connected between the capacitor 28 and power input terminals 12 and 12’ to limit current flowing into the capacitor 28 while the capacitor 28 is reformed. (Abstract.)

After the capacitor 28 is charged, the capacitor 28 can be very rapidly discharged through a flash discharge tube 30 to create a flash of light, such as to facilitate taking a photograph. (Col. 2, line 64 to col. 3, line 6.) However, the flash discharge tube 30 must be triggered by a trigger circuit 32 before the capacitor 28 discharges through the flash discharge tube 30.

Even when triggered, however, the flash discharge tube 30 is not powered directly from the power input terminals 12 and 12’. The input voltage of the power input terminals 12 and 12’

is insufficient to power the flash discharge tube 30. Thus, a voltage-doubler circuit (which includes the storage capacitor 28, a first and a second diode 24 and 26 and a second capacitor 22) is used to develop a voltage that is sufficiently high to operate the flash discharge tube 30.

Introduction

The Applicant respectfully asserts that the combination of references cited by the Examiner does not teach all the elements recited in claim 1. Furthermore, Hirao teaches away from the claimed invention. Even if, *arguendo*, the references teach all the elements in claim 1, there is no motivation to combine the cited references. Each of these points is discussed separately, below.

All Elements Not Disclosed or Suggested

The Examiner cited Flory's blocking rectifier 62 as anticipating the recited "current limiting element." The Applicant respectfully submits that reliance upon Flory in this respect is not justified, because Flory's blocking rectifier 62 does not meet the claim limitation. (Unamended claim 1 recites, "a current limiting element coupled between the input and the capacitive storage, the current limiting element at least in part controlling current flow from the input to the capacitive storage.") Flory's blocking rectifier 62 does not control current flow from the input to the capacitive storage, as recited in claim 1. Instead, Flory's blocking rectifier 62 prevents "bleedback," i.e., the blocking rectifier 62 prevents current flow in the opposite direction, i.e., from the ESB 48 to the input. (Col. 5, lines 27-49.) More specifically, the blocking rectifier 62 prevents current from flowing out of the ESB 48 back through the input to a non-lighting load. In contrast, the recited current limiting element limits "current flow from the input to the capacitive storage." (Emphasis added.)

In addition to providing a structural difference, the recited limitation provides a functional advantage over Flory. Controlling current flow from the input to the capacitive storage enables the rotor circuitry to operate, even while the capacitor is charging, i.e., controlling the current flowing into the capacitive storage prevents the capacitive storage from "starving" the rotor circuitry of current. Neither Flory's blocking rectifier 62, nor any other part of Flory's system, prevents such starvation.

According to the Examiner's interpretation, "Flory discloses continued operation that indicated that the operation begins within one second after start-up." (Office Action: page 3, line 15.) Flory's luminaire 30 can begin operation quickly, but not because of any control of the

current flowing into the ESB. Instead, the luminaire 30 can begin operation quickly because the power supply 18 is capable of delivering large currents. The power supply 18 is capable of powering several devices on a crane, including the luminaire 30, motors, control circuits and electromagnets 34. (Col. 1, lines 21-40, and col. 4, lines 15-26.) Thus, the power supply 18 is certainly capable of simultaneously charging the ESB and operating the luminaire 30. One would not expect the motors and electromagnets 34 to be operated when the power supply 18 is first turned on. The lack of motor or electromagnet 34 load on the power supply 18 leaves enough power supply “headroom” to charge the ESB and operate the luminaire 30. The ESB takes at most a few seconds to charge. Thus, the ESB has time to charge, before the motors and electromagnets 34 place additional loads on the power supply 18.

In contrast, when a limited-capacity power supply is used, the current flow from the input to the capacitive storage can be limited, as recited in claim 1, to enable the rotor circuitry to operate.

In addition, the term “controlling current flow,” as used in the present Application, means controlling an amount of current flow. Flory does not disclose controlling an amount of current flow into or out of the ESB. For clarity, claim 1 has been amended to recite, “the current limiting element at least in part controlling an amount of current flow from the input to the capacitive storage.” (Emphasis added.) Thus, an element that merely controls a direction of current flow does not meet the amended claim limitation. Support for this amendment can be found in the specification, at least in the paragraph that begins on page 4, line 23, and the paragraph that begins on page 7, line 13. This amendment is not made in response to any rejection in the above-identified Office Action.

No art of record, either alone or in combination, discloses or suggests a fan controller that includes a current limiting element that at least in part controls current flow from an input to a capacitive storage, as recited in unamended claim 1. (Emphasis added.) Furthermore, no art of record, either alone or in combination, discloses or suggests a fan controller that includes a current limiting element that at least in part controls an amount of current flow from an input to a capacitive storage, as recited in amended claim 1. (Emphasis added.) For at least these reasons, claim 1 is believed to be allowable.

Independent claims 7 and 13 recite similar limitations. These claims are, therefore, believed to be allowable, for at least the reasons given above, with respect to claim 1.

Claims 2-6, 8-12 and 14-24 depend directly or indirectly from claim 1, 7 or 13. These dependent claims are, therefore, believed to be allowable, for at least the reasons discussed above, with respect to claim 1.

The Applicant respectfully requests that the rejection of claims 1-21 be withdrawn.

As noted, the current limiting element is connected in series between the input and the capacitive storage. For clarity, claim 1 has been amended to recite, “a current limiting element coupled in series between the input and the capacitive storage.” (Emphasis added.) This amendment is not made in response to any rejection in the above-identified Office Action.

No Motivation to Combine the Cited References

Even if, *arguendo*, the cited references disclose all the recited elements in claim 1, there is no implicit or explicit motivation, either in the references themselves, nor in the knowledge generally available to one of ordinary skill in the art, to modify Hirao’s fan controller with Flory’s ESB or the teachings of Hardy.

Neither reference describes a problem that any of the other references solves. Hirao is concerned with making a fan controller that operates a fan as quietly as possible. Hirao explicitly teaches that the fan is to be stopped when a power off command is received. (Col. 5, lines 25-27, and Fig. 3.) Thus, Hirao explicitly teaches away from operating the fan after the power off command is received. There is, therefore, no motivation to combine Hirao’s fan controller with a circuit that can operate the fan after power has been turned off.

Conclusion

The combination of references cited by the Examiner does not teach all the elements recited in claim 1, even before claim 1 was amended. Flory’s blocking rectifier 62 does not control current flow from the input to the capacitive storage, as recited in claim 1. Instead, Flory’s blocking rectifier 62 prevents “bleedback,” i.e., the blocking rectifier 62 prevents current flow in the opposite direction, i.e., from the ESB 48 to the input.

The cited references do not teach all the elements recited in amended claim 1. Flory’s blocking rectifier 62 does not control an amount of current flow from the input to the capacitive storage, as recited in amended claim 1.

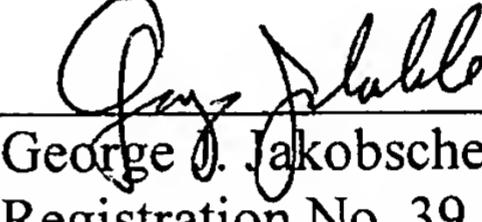
Furthermore, Hirao teaches away from the claimed invention. Hirao explicitly teaches away from operating the fan after the power off command is received. Thus, even if, *arguendo*,

Application 10/616,499
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Response A to Office Action of April 24, 2006

the references teach all the elements in amended claim 1, there is no motivation to combine the cited references.

For all the foregoing reasons, it is respectfully submitted that the present Application is in a condition for allowance, and such action is earnestly solicited. Applicant hereby requests that any extension-of-time or other fee required for timely consideration of this application be charged to Deposit Account No. 19-4972. The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present Application.

Respectfully submitted,



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